Shiny Happy People Building Trust?
Photos on e-Commerce Websites and Consumer Trust

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ABSTRACT

Designing for trust in technology-mediated interaction is an increasing concern in CHI. In advertising, images of people have long been used to create positive attitudes to products or trust in brands. However, the evidence as to whether placing photographs of people on e-commerce web sites has the intended effect has been mixed. This paper reports a study that examined the effect of adding such photographs to 12 existing e-commerce sites, whose reputation had been established through customer ratings. In an experiment with 115 participants, trust was measured using methods that induced financial risk, adapted from experimental economics. Averaging across sites, neither the presence of a photo, nor trustworthiness of the person depicted, had a significant effect. However, the presence of photos reduced participants' ability to identify vendors with good and bad reputations – the perceived trustworthiness of poorly performing vendors was increased, whereas that of vendors with good reputation was decreased. This result advocates caution when using photos on e-commerce sites to boost trustworthiness, and demonstrates the need for further research into interpersonal cues and on-line trust.

Keywords
Web, E-Commerce, Trust, Photos, Interpersonal Cues

INTRODUCTION

Emotional images of people are widely used in advertising and branding as a means of creating positive attitudes to products and trust in brands [14]. Given concerns about lack of trust in e-commerce [17] it is not surprising that many CHI experts also advocate their use to increase transparency and build trust in e-commerce [18, 6]. Indeed, Steinbrueck et al. [24] found that images of employees can increase users' trust perceptions of e-commerce sites. In an

earlier study, however, we found that such photos can produce a variety of responses, including negative reactions and lower trust [21]. The experimental study reported in this paper was designed to address the questions raised by these contradictory findings. We systematically investigated the effect of adding photos depicting sales assistants to 12 e-commerce sites (half with a good, half with a bad reputation). We conducted pre-experiments (1) to select appropriate photos and (2) to validate new methods for measuring trust, adapted from experimental economics. We start by introducing the conceptual basis for photos as trustbuilders and discuss the empirical evidence that formed the basis of our hypotheses. In the section 'The Study', we describe the design of the experimental study, including the pre-experiments, and present the results. Subsequently we discuss the implications of these findings for (a) trust research and (b) practitioners and indicate directions for future research.

BACKGROUND

Relevance of Trust

As technology-mediated interaction increasingly replaces face-to-face interaction in many areas of life, designing for trust becomes a central concern for the research community [3]. Since low-trust interactions are expensive in both economic and human terms [27], such technologies must allow users to build and maintain trust in each other, and in the technology itself. Business to consumer e-commerce is an area in which the need to design in a way that fosters trust is particularly pressing [2]. E-commerce stretches interaction over time (e.g. the time between order and fulfilment) and space [2]. Local face-to-face interaction is replaced by a complex socio-technical system that is not – and cannot be expected to be – fully understood by most consumers. This unchaining of interaction from local context and personal relationships is a pervasive process in modern societies, known as *dis-embedding* [8]. Dis-embedded interactions carry higher risks than embedded interactions, due to their increased complexity. The specific risks that stem from the disembeddednes of e-commerce are risks related to the technology used (e.g. security of data transmission) and risks related to the temporal and spatial distance from the vendor (e.g. post-order fulfilment,

adherence to privacy policies) [20]. Trust helps to reduce this complexity – it is a shortcut for a detailed, laborious evaluation of the relevant risks and benefits [16].

Conceptual Basis

When assessing an online vendor's trustworthiness prior to a transaction, a potential shopper processes trust cues from many sources – the interface being an important one [6, 20, 23]. Research to date on such interface cues, often referred to as *surface cues*, mainly focussed on cognitive dimensions [3] of trust. Lahno [15] equates *cognitive trust* with *reliance*: It is based on cues that show that the vendor has a rational interest – and also the ability – to act as promised [5]. Examples are third-party assurance mechanisms such as trust seals, or links to well-established brands [23], as they show past investment and control by external agencies. However, trust encompasses more than just reasoning about the vendor's motivation and ability. Lahno defines trust as an *emotional attitude* that encompasses both cognitive and affective dimensions [15, 3]. Qualitative user studies on trust in e-commerce [23] as well as consumer research [1] confirm that affective reactions have a strong impact on consumer decision-making. Interpersonal cues that are emitted and perceived in face-to-face encounters – such as gestures, mimics and appearance – are powerful triggers of such responses [10]. Giddens [8] observes that trust in dis-embedded systems is often maintained through face-to-face interactions with representatives. This holds true even in situations where a representative's trustworthiness has little significance for an organisation's trustworthiness. He refers to this practice as *re-embedding*. Based on this concept, we introduced the notion of *virtual re-embedding* [20], an approach that aims to draw on interpersonal trust cues to build affective trust in e-commerce. Photos are one way of using such cues.

Impact of Photos

Olson et al. [19] found that photos of participants increased cooperation in social dilemma games played via text chat. Fogg [7] showed that photos of authors can increase the credibility of online articles. Steinbrueck et al. [24] found that a photo of an employee on the homepage of an online-bank significantly increased user trust. Trust was measured with a questionnaire, developed by Kammerer [13]. However, there is also evidence that photos in e-commerce interfaces can lead to negative reactions and destroy trust. Out of the four distinct user groups we identified in a qualitative study [21], two responded negatively to photos: 1. Non-shoppers with a very low tendency to trust e-commerce saw photos as attempts at trust manipulation. 2. Existing online-shoppers, with a high preference for efficient interactions (termed *function-seekers*) reacted negatively to the photos, as they 'cluttered the interface without providing any added functionality'. Reactions also varied with different roles and faces, such as photos of employees, the business owner, or a 'happy customer' receiving goods [21]. Nielsen (personal communication, 2002) further suggested that photos of 'perfect' people may

undermine credibility and thus destroy trust, as they are clearly not real employees.

RESEARCH QUESTIONS AND HYPOTHESES

In the light of these conflicting results, the study reported in this paper had two main aims: (1) While previous research elicited user perceptions of trustworthiness through interviews and questionnaires, this study examined participants' decision-making in the presence of financial risk. The effect of photos is thus subjected to a harder test (see 'Measures'). (2) Research to date has investigated the effect of adding one [24] or a small number of photos [21] to one specific e-commerce site. This study analyses the effect of adding 8 photos, one by one, to 12 existing e-commerce sites.

Site variables: We use 12 existing e-commerce sites. We expect the variable *'site' to have a main effect on participants' trust (Hypothesis 1)*, as existing sites differ in the surface cues they give. More precisely, we expect *sites of trustworthy vendors[1] to be trusted more than untrustworthy ones (H2)*. In other words, we expect 'good' vendors to emit surface cues that lead users to perceive them as more trustworthy.

Photo variables: The core interest of this study is the hypothesis that *presence of a photo of a person on the homepage has an effect on users' trust in a vendor (H3)*. To investigate whether the contradicting results of studies to date might be due to differences in photos, we included 4 photos that had been rated as very trustworthy, and 4 photos that had been rated as less trustworthy in pre-experiment 1 (see 'Materials'). Our hypothesis is that *trustworthiness of the person shown on the photo has an effect on users' trust in the vendor (H4)*. Based on Egger and Nielsen [6, 18] and findings from advertising research [25], we control for the following photo variables: gender, professional quality of the photo, and whether the person appears to be a model (see 'Materials').

User variables: This study focused on online-shoppers, as affective trust measures are unlikely to convince non-shoppers to order online [20]. Among the on-line shoppers, *function-seekers* reacted negatively to photos in our previous study [21]. We aimed to test this finding by identifying *function-seekers* with responses to 3 statements drawn from our previous qualitative study. We expect that *function-seekers will trust sites displayed with photos less then non function-seekers (H5)*. We also controlled for Internet usage experience, Internet shopping experience, Internet attitude, and Internet risk perception [24, 12].

THE STUDY

Materials

Photos (Pre-experiment 1)

To find photos that could believably depict employees of online vendors, we conducted a pre-experiment. 29 stock

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[1] The operationalisation of a vendor's trustworthiness is described in the section 'Materials'.

photos of people (15 male, 14 female) were presented to 69 participants. The photos were embedded, one by one, in the homepage of an online vendor and participants rated the trustworthiness of the person on the photo on a 7-point Likert scale. In a second stage, participants rated the photos in terms of whether they believably depicted a 'real person' (an employee of a company) and whether they were of professional quality. Pre-experiment 1 was conducted online and we counterbalanced presentation order.

We found that women received higher trustworthiness ratings than men. However, in order to allow for an analysis of gender effects in the main study, we chose 2 male and 2 female photos for the groups of trustworthy and untrustworthy photos. Trustworthy photos differed from untrustworthy photos on all measures (p<.01, see Table 1).

Table 1. Results from pre-experiment 2: Photos selected for the main study.

ID	Trust-Level	Gender	Trust-Rating	Real Person	Prof. Photo
			1 low 7 high	1 model 7 real	1 prof. 7 unprof.
1	High	Female	5.31	3.80	3.54
2	High	Female	5.38	3.42	2.12
3	High	Male	5.12	6.26	4.77
4	High	Male	4.48	4.86	3.67
Mean Trustworthy Photos			**5.07**	**4.86**	**3.51**
5	Low	Female	3.48	1.46	1.65
6	Low	Female	3.83	1.57	1.66
7	Low	Male	3.03	1.75	2.23
8	Low	Male	3.07	2.60	2.32
Mean Untrustworthy Photos			**3.35**	**1.85**	**1.97**

For each site, all photos were entered in the same position on the homepage. A label giving the person's name and role ('Customer Care') was added. Care was taken to preserve the overall appearance of the sites.

Sites

We chose US e-commerce sites from 3 different domains: digital cameras, computer hardware, and flower services. We chose US websites for UK participants, as it constituted a realistic scenario with high risk, due to the vendor and user being located in two different countries. Digital cameras and computer hardware were chosen, as these are popular items to be ordered online that carry a considerably higher financial risk than e.g. books. Internet flower services carry less financial risk, but poor service could result in high non-monetary cost, such as embarrassment. Hence, trust is of high importance in all three domains. For each domain, we chose two trustworthy ('*good*') vendors and two untrustworthy ('*bad*') vendors. We differentiated trustworthy from untrustworthy vendors based on reputation ratings, established by *Bizrate[2]* and

Epinions[3]. These services aggregate feedback from customers of e-commerce sites based on post-order service, and handling of privacy and security. Thus, these ratings are not based on the quality or appearance of the web site, but on actual post-order performance. Ratings are given on a scale from 1 to 10^4. The vendors chosen were among the best and poorest performers in their respective domains (Table 2).

Digital Cameras				Computer Hardware				Flower Services			
8	8	3	2	9	9	2	3	9	10	4	4

Table 2. Vendors' reputation ratings (grey: 'good' vendor, white: 'bad' vendor).

We mirrored the homepages and the next two layers of the vendors' sites on our server. This allowed us to vary the home pages according to the experimental conditions. We removed any trust or reputation seals that were present on some pages. The mirroring led to some functions (such as *shopping cart* or *search*) not being available in our experimental version. However, on all sites, participants were able browse detailed product descriptions and to access general information on the company (such as privacy and security policies). We chose this approach to maximise ecological validity of our experimental set-up, allowing participants to explore the sites as they wished.
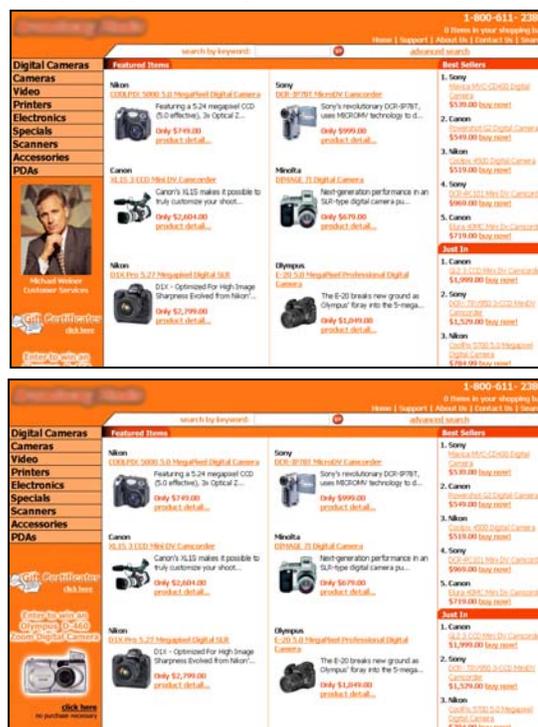

Figure 1. Examples of pages with and without photo added (vendor reputation: 3, photo no. 8 , see Table 1).

[2] http://www.bizrate.com

[3] http://www.epinions.com

[4] Epinions gives ratings in terms of the percentage of customers that would buy again. We converted this figure to a rating from 1-10.

Measures

After introducing the decision-based trust measures, we report the results of pre-experiment 2, in which we tested them.

Trust Game – Risk Taking

Drawing on experimental economics, this measure was modelled on the first move in a social dilemma game known as *trust game* [4]. In a trust game the first mover decides whether to make herself vulnerable to a second mover's actions and how much to risk in order to achieve a gain. A trust game is thus a good model for e-commerce, where the potential customer first decides whether to trust, and then waits for the vendor's fulfilment [22].

This measure was presented as an investment in a vendor. Participants could invest in steps of 10 pence up to 100 pence ($1.50) per vendor. Investments in 'good' vendors earned them up to £1 on top of their final pay, investments in 'bad' vendors resulted in a loss of the investment. As described above, we differentiate 'good' from 'bad' vendors based on their reputation ratings that reflected fulfilment and post-order service quality. The participants' decisions in the experiment potentially impacted their final pay in a range of +/-£12 ($18), because they did not know the ratio of 'good' and 'bad' vendors in the experiment. As our sample consisted mainly of students (for which these amounts have a high utility) this range created a considerable risk. The level of trust was measured as the amount of money participants were willing to risk. This reflects actual behaviour, where we risk only a small amount with vendors we don't know and have little trust in. We then risk more as our knowledge and trust grow. This operationalisation reflects the definition of trust as "willingness to increase one's vulnerability" [3].

Clearly, this measure is confounded with a participant's general propensity for taking risks. To account for this, we also measured each participant's willingness to invest in a chance event, and used this measure for a regression on the participant's willingness to invest in vendors (see 'Description of Sample & Measures').

Assessment of Reputation

As a secondary measure, we asked participants to assess the 12 online-vendors' fulfilment and post-order service quality level. Participants were asked to rate the vendors on a scale from 1 to 10 and knew that the actual rating had been established via the reputation systems *Bizrate* and *Epinions*. We motivated them to be as accurate as possible with a *quadratic incentive scheme*. This scheme had been shown to elicit the expected value of a participant's probability distribution over several possible ratings [11]. We paid £6 ($9) on top of the participants' base pay, and deducted from that according to the squared error of their assessment from the actual rating. We framed inaccurate assessments as losses, rather than correct ones as gains, to emphasize the presence of risk. Tversky & Kahneman [26] established that risk perception depends on such differences in framing.

Pre-experiment 2

Research on trust in e-commerce to date relied on qualitative interviews [21, 23] or questionnaires [24, 12]. In order to validate our new decision-based measures against the previously used ones, we conducted pre-experiment 2. 13 participants rated 2 sites with Kammerer's [13] trust questionnaire and via the new measures 'risk-taking' and 'assessment'. Table 3 shows that the measures correlate significantly, and that the questionnaire results explain approximately 50% of variance in the new measures.

Table 3. Correlations between new measures and e-commerce trust questionnaire.

Measure	r²	Test Statistics
Risk-Taking	.50	T(23)=.4.8, p<.05
Assessment	.44	T(23)=4.2, p<.05

We argue that our decision-based measures are better predictors of actual behaviour than questionnaires and verbal accounts. The latter are known to be subject to post-hoc rationalisation because respondents want to appear as rational decision makers. As our research is concerned with affective trust, which is grounded on pre-rational reactions, this problem becomes particularly relevant. It is further aggravated when using questionnaire tools, as they – unlike open-ended qualitative interviews – prompt specific dimensions of trust reasoning that may not be systematically evaluated in a real-world situation. (Trust is, after all, a 'shortcut' mechanism – see section 'Conceptual Basis'). Trust is best operationalised by having participants make real decisions under risk [9]. Such measures impose a more conservative test on the effect of photos as trustbuilders than standard trust ratings.

Preferences

As a final measure, we took the participants' preference ranking: For each domain, we asked them to rank the 4 sites reflecting 'where they would feel most comfortable buying from with price and other conditions being equal'. We included this measure to find effects on purchase decisions.

Design

We measured trust for 96 photo-site combinations (8 photos across 12 sites) and for 12 baseline conditions (sites without photo added). Each participant gave responses for 12 sites. Each participant saw a particular photo only once. The photo type (trustworthy, no photo, untrustworthy) was counterbalanced for site reputation (good, bad). Presentation order of the sites within the shopping domains (camera, computer, flowers) was randomised.

Procedure

When participants arrived at the lab, they first conducted a practice exercise to familiarise themselves with the investment task and the experimental system. We stressed that it was at their own discretion whether they wanted to invest parts of their base pay. Then they completed the questionnaire eliciting the user variables. In the actual

study we asked them for each domain to imagine shopping for a specified product and to form an impression of the 4 sites in that domain. They had up to 10 minutes for each shopping domain and could explore the sites provided in any way they wished (see section 'Materials'). Once they had formed an impression they went on to the questions for that set of sites. To facilitate recall of the sites when completing the questionnaires, thumbnails of the homepages as seen by each participant were displayed. After completing all 3 shopping domains, we paid the participants and conducted short interviews to find out what factors they had based their decisions on.

RESULTS

Description of Sample & Measures

We had 115 participants (61 female, 54 male, average age 25) in this study, who had online-shopping experience and lived in the UK at the time of the study. 110 participants were undergraduate or postgraduate students, 5 participants were members of staff. As each participant evaluated all 12 sites, this resulted in 9-10 measurements for each of the 96 photo-site combinations, and 38-39 baseline measurements (without a photo added) for each site. In post-experimental interviews, no participant mentioned the photo-manipulation, which indicates that the photos had been added to the sites in an unobtrusive manner. In line with expectation, there was a significant correlation between a participant's willingness to invest in a chance event and his or her average level of investment on the sites (Spearman's $r = .46$, $p<.01$, $n=115$). Thus we conducted a regression analysis with individuals' mean investment on sites as dependent and investment in a chance event as independent variable ($r^2=.23$, $p<.01$, $n=115$). We used the participants' individual residuals of this regression to partial out the effect of their propensity for taking risks.

Test of Hypotheses

An analysis of variance (ANOVA) with site as a within-subjects factor shows a significant effect for all measures: Participants were (1) willing to *risk* different amounts of money on the sites; they (2) *assessed* the sites significantly differently in terms of their expected reputation rating; and (3) showed significant differences in their *preferences* to buy from some sites over others. H1 is thus confirmed for all three measures (Table 4).

Without photos added, participants differentiated vendors with a bad reputation from vendors with a good reputation: Comparing the mean *assessment* and the mean *preference* responses within-subjects showed that 'good' vendors performed significantly better. H2 is thus confirmed for these measures (Table 4).

However, based on our data, the hypothesis that adding photos to websites increases trust irrespective of site (H3) cannot be upheld. Furthermore, the hypothesis that a photo's trustworthiness affects trust across all sites (H4) is not supported (Table 4). None of the photo-variables we controlled for (gender, 'realness' of person, professional

quality of photograph) had a significant effect. Analysing the data for effects of user variables also did not show any significant effects. This holds true for *function-seekers* (H5): we could not find a difference between this group and others (Table 4).

Table 4. Results for hypotheses.

Factor	Risk-Taking	Assessment	Preference
Site (H1)	$F_{(11,1254)}=5.15$ $p<.001$	$F_{(11,1254)}=6.02$ $p<.001$	$F_{(11,1254)}=7.48$ $p<.001$
Reputation Rating (H2)	$t_{(114)}=-1.83$ $p=.07$	$t_{(114)}=-2.85$ $p<.01$	$t_{(114)}=-2.19$ $p=.03$
Presence of Photo (H3)	$t_{(114)}=-.01$ $p=.99$	$t_{(114)}=-.60$ $p=.55$	$t_{(114)}=-.61$ $p=.54$
Trust-worthiness of Photo (H4)	$F_{(2, 228)}=.01$ $p=.99$	$F_{(2, 228)}=.19$ $p=.83$	$F_{(2,228)}=.23$ $p=.79$
Function Orientation (H5)	$t_{(100)}^x=-.023$ $p=.98$	$t_{(96)}^x=1.43$ $p=.89$	$t_{(99)}^x=-1.27$ $p=.21$
^{x} Using Levene's correction for unequal variances.			

Exploratory Results

We calculated the error of a participant's assessment of a site's trustworthiness from the site's actual trustworthiness. The assessment error for sites with a photo was significantly greater than for sites without ($t_{(114)}=-2.17$, $p=.03$). The interaction graph for the 'assessment' measure (from 0 – untrustworthy to 10 – trustworthy) given in Figure 2 shows that participants rated 'good' and 'bad' vendors similarly, but significantly different in the no-photo condition (6.0 vs. 6.6). This small difference was however, removed by adding a photograph to the sites. Tests for the measures 'risk-taking' and 'preference' show the same pattern.
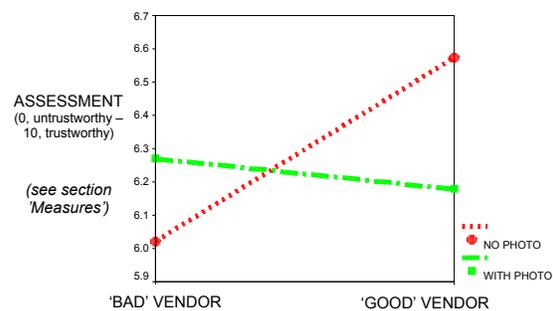

Figure 2. Interaction between site reputation and presence of photo ($F_{(1, 114)}=5.48$, $p=.02$).

To investigate further, we categorised the vendors according to their baseline results in the study. Averaging across all three measures, we grouped them into trusted vendors (upper quartile), untrusted vendors (lower quartile) and average vendors (mid quartiles). We conducted a repeated measures multiple analysis of variance (MANOVA) including all 3 measures (risk-taking, assessment, preference) with the new site categorisation and presence of a photo as fixed factors. As was to be expected, site-type had a main effect ($F_{(6, 71)} =7.85$,

p<.001). Supporting the results of our previous analysis (Table 4), presence of a photo had no significant effect ($F_{(3, 74)}=1.51$, p=.22). However, we found an interaction between presence of a photo and site-type ($F_{(6, 71)}=2.89$, p=.01): A photo displayed on the home page appears to result in less trust given to a vendor that is trusted without a photo. Vendors that were not trusted without a photo, however, seem to benefit from adding a photo (Figure 3).
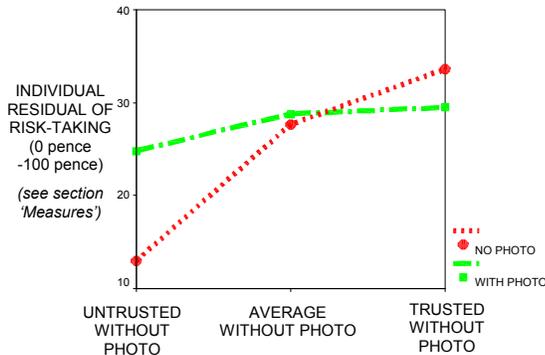

Figure 3. Interaction between re-categorised site-type and presence of photo for the risk-taking measure (Univariate Analysis: $F_{(2, 75)}=3.75$, p=.03).

DISCUSSION

Effects of Sites

Our data supported H1: Based on their exploration of the interface, the participants risked different amounts with different vendors, and assessed them differently with regard to their putative post-order level of service. Thus, users try to infer a vendor's trustworthiness from his web site. H2 tested whether they do so correctly: Indeed, participants could differentiate 'good' vendors from 'bad' ones based only on surface cues. However, while the vendors we chose were either very good (rating 8-10) or very bad (rating 2-4), the average ratings given by participants were 6.0 for the bad sites and 6.6 for the good sites[5]. This indicates that users are able to differentiate 'good' from 'bad' vendors, however, only by a small margin.

Effects of Photos

We could not find a main effect of the presence of photos on trust or on user preferences across all sites (H3). Thus, the results should discourage the notion that photos are a guaranteed way to build trust. Also, when looking at specific photo types - such as the ones rated as very trustworthy in pre-experiment 1 – there is no overall effect (H4). This also holds when analysing for effects of gender, 'realness' of the person depicted, or professional quality of the photo. That a person appears to be a real employee, or that a person appears to be trustworthy, is thus not a guarantor for a photo's positive effect on trust when placed on a website. There is no simple heuristic as to what photos

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[5] As indicated in Table 4, good and bad vendors were rated significantly differently on a per participant basis ($t_{(114)}=-2.85$, p<.01).

to put on an e-commerce site to increase trust.

However, our analysis did show an effect of photos. In this respect, this study confirms Steinbrueck et al. [24] and our earlier work [21]. Even with the decision-based measures used in this study, a photo of a person shown on only one page of a site has an effect on trust. This is an impressive effect based on a minimal interpersonal cue. Taken together, these findings encourage further exploration of the effect of interpersonal trust cues in e-commerce.

Effects of photos seem to be more dependent on photo-site interactions than on photo-variables. Clearly, this statement cannot be generalised beyond the type of photos we used. In this group, however, the effects of photos seem to depend mainly on a fit between the person depicted, as well as the style of the photo and the vendor's brand identity.

Individual Differences

Even with some of the variance in reactions explained by photo-site interactions, there are large individual differences in the reaction to photos on e-commerce sites [cf. 21]. A particular photo on a particular site might induce one user to trust while the same photo on the same site decreases another user's trust. The user variables we controlled in this study did not explain these individual differences, a finding in line with Jarvenpaa & Tractinsky [12] and Steinbrueck et al. [23].

In an earlier study [21] we suggested *function-seeking* as a pre-disposition for negative responses to photos. The results of this study do not corroborate this notion (H5). However, in contrast with the set-up used then, this study only used one photo on a site, and participants were not used to the site without photos prior to the study. Furthermore, *function-seeking* was only operationalised through 3 statements. To further investigate the concept of *function-seeking*, a better operationalisation needs to be developed.

Effect of Photos on Accuracy of Trust Attribution

A worrying result of this study is the relationship between the actual trustworthiness of an online-vendor and the effect of a photo on its website. When no photo was added, participants trusted trustworthy vendors more than untrustworthy ones (H2). Adding any photo from our study to untrustworthy sites improved the participants' assessment for these sites. Correspondingly, adding a photo to a trustworthy site decreased participants' trust. Photos, in other words, seem to decrease users ability to differentiate 'good' from 'bad' vendors – in the sense that they helped bad vendors, but did not work on good vendors' pages.

How can we explain the interaction between vendor trustworthiness and the effect of presence of a photo? Looking at the poorest and the best performing sites in our study, it seems that users' trust and preference ranking are mainly influenced by the professional quality of the page design. On the site that looked distinctively unprofessional (the poorest performing site in the study), the presence of any photo had a positive effect. On the very professional-

looking sites, however, most photos had a negative effect. We offer two potential explanations for this result that need to be investigated further.

1. Non-professional looking sites might be equated with private homepages; essentially being run by a single person. Here the photo has a high believability, higher social presence is achieved. On a very professional and corporate looking page, photos can be perceived as overt attempts at manipulation – in the worst case or, if they match the brand identity, just as standard marketing practice.

2. It has been stressed before that the perception of trustworthiness is dependent on coherence. One cue to the contrary can destroy an otherwise trustworthy appearance [16, 20]. On a poorly designed page, a photo may not be able to destroy coherence, as all other elements are already in dissonance. So, its immediate emotional effect outweighs the trust-lowering potential it could have by clashing with the brand identity on a well-designed page.

CONCLUSIONS

Limitations

Before reaching the conclusions, we want stress some limitations of this study. Firstly, this study was conducted with university students. The effect of interpersonal cues might thus be underestimated for customer groups more tuned to face-to-face transactions (e.g. pensioners). Secondly, while overcoming problems of post-hoc rationalisation, this study still relied on financial risk, rather than real complex risk [22]. Only field studies with real sites can overcome this limitation.

Implications for e-Commerce

For practitioners, the main result of this study is that adding photos of people to e-commerce websites is not a panacea for improving customer trust – unless you are running a site that is not to be trusted: our results suggest that the trustworthiness of low-trust sites can be boosted by adding a photo, for reasons we can only speculate on at present (see 'Discussion').

Effects of photos cannot be tied to specific photo variables, such as the 'realness' of the person shown. Rather, their effect appears to depend on interactions between photo and site. It is crucial to match the photo to the site's design and the vendor's brand. Adding any generic stock photo to a site is not a way to build trust.

Thus, at this stage our advice is to test any form of interpersonal cues on the site with the target users before implementing them. If testing is not feasible, it might be better to look for other ways of increasing a site's trustworthiness. Fogg [7] and Egger [6] give an overview on other interface factors that impact perceived trustworthiness and credibility.

Implications for trust research

From a researcher's point of view, the main result is that minimal interpersonal cues given in a photo on the homepage can have a significant effect on users' trust in the whole site. Thus, our results encourage exploration of the impact of virtual re-embedding.

From a methodological point of view, this study showed that methods from experimental economics that are based on decision-making under financial risk can be adapted to e-commerce trust research. As they overcome some of the problems of the methods previously used, these measures should be further developed in this domain.

Finally, our findings advocate a change of the experimental paradigm for research into trust cues. Our results indicate that effects of specific interface elements (such as photos) on trust are mediated by site variables. In order to test for such interaction effects, researchers must test across several sites. Furthermore, comparing users' perceived trustworthiness to vendors' actual trustworthiness (established via reputation ratings) allows investigating the effect of interface elements on the correctness of users' trust attribution.

Future Work

First, the interactions between site variables and photos suggested in our exploratory analysis should be subjected to experimental tests.

A question that has not been addressed by this study is the potential conflict between photos or interpersonal cues and usability, exemplified by *function-seekers* in our earlier study [21]. We plan to explore the effect of interpersonal cues on a micro-level, with eye-tracking and physiological measurements. This should identify their impact on visual attention and affective responses [28].

Finally, the finding that photos had the most uniform positive impact for the worst performing vendors raises concern. Researchers cannot only focus on providing guidelines for the practitioner who is concerned with increasing the trustworthiness of a site. If interpersonal cues reduce users' ability to make correct trust decisions, this is a decrease in usability with far reaching implications: Finding that they cannot rely on their perception of trustworthiness will lower users' general level of trust in e-commerce. As set out in the introduction this fosters costly low-trust interactions, which are undesirable for both users and vendors in the long term.

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[6] http://www.cs.ucl.ac.uk/research/ higherview

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